





## High Dimensional Nonstationary Time Series IRTG 1792 Short Course

## Natalie Packham Extreme Value Theory

Extreme Value Theory (EVT) is the branch of probability theory that deals with extreme events.

Typical applications are the statistical modelling of financial risks and insurance risks, especially when data are "heavy-tailed" and the asymptotics of the normal distribution do not apply.

The short course introduces the most important concepts and theorems in EVT, in particular the relevant limit theorems for best (or worst) outcomes and for the distribution tail. Their use will be demonstrated in financial applications covering financial risk management (value-at-risk and expected shortfall) for heavy-tailed distributions, credit stress-testing for elliptical distributions and tail-risk protection trading strategies. Further topics, such as spectral risk measures and quantile regression will be mentioned.



Natalie Packham is Professor of Mathematics and Statistics at Berlin School of Economics and Law. Natalie has several years of industry experience as a office software front engineer at an investment bank, and is frequently involved in industry-related research and consulting projects. Her research expertise includes Mathematical Finance, Financial Risk Management and Computational Finance, and her academic work has been published in leading journals in the fields. She is associate editor of "Methodology and Computing in Applied Probability" and co-chair of the GARP Research Fellowship Advisory Board. Natalie holds an M.Sc. in Computer Science from the University of Bonn, a Master's degree in Banking & Finance from Frankfurt School of Finance & Management, and a Quantitative Ph.D. in Finance from Frankfurt School.

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